

What is claimed is:

1. An etching method for a ZnSe polycrystalline substrate, wherein reactive ion etching is applied by means of only chlorine-based gas which does not include a hydrocarbon group.

5 2. An etching method for a ZnSe polycrystalline substrate, wherein reactive ion etching is applied by mixing:  
chlorine-based gas which does not include a hydrocarbon group; and  
inert gas or gas which does not react to ZnSe.

10 3. An etching method for a ZnSe polycrystalline substrate as set forth in Claim 2, wherein  
said inert gas includes Ar.

4. An etching method for a ZnSe polycrystalline substrate as set forth in Claims 1 through 3, wherein  
said chlorine-based gas includes  $\text{BCl}_3$  gas.

15 5. An etching method for a ZnSe polycrystalline substrate as set forth in Claims 1 through 3, wherein  
said reactive ion etching is performed at a gas pressure of 0.5Pa through 1Pa.

20 6. An etching method for a ZnSe polycrystalline substrate as set forth in Claims 1 through 3, wherein  
the gas is activated by means of a radio frequency.